CLAIMS

1. A method of making a magnetic write head assembly which has a head surface and a track width at the head surface comprising the steps of:

forming a first pole piece layer of a first pole piece which has a pole tip portion, a back gap portion which is recessed from the head surface and a yoke portion which is located between the pole tip and back gap portions;

forming an insulation stack with at least one coil layer embedded therein on the yoke portion of the first pole piece layer;

forming a pedestal of the first pole piece on the pole tip portion of the first pole piece layer;

forming a write gap layer on the pedestal;

forming a first component of a second pole piece on the write gap layer with a width at the head surface which is greater than said track width and with a throat height that extends from the head surface into the head assembly where the first and second pole pieces first commence to separate after the head surface;

forming a second component of the second pole piece on the first component which has said track width; and

with the second component employed as a mask ion milling the first component to define the first component with said track width.

2. A method as claimed in claim 1 further comprising the step of:

forming the first component with a throat height that is less a height of the pedestal into the head assembly.

3. A method as claimed in claim 2 wherein said ion milling also notches the pedestal with said track width.

4. A method as claimed in claim 2 further comprising the steps of:

forming the second component with a height into the head assembly which is greater than said zero throat height and which is located between the zero throat height and the insulation stack; and

forming a third component of the second pole piece which is stitched to the second component and which extends over the yoke and back gap regions and is magnetically connected to the back gap portion of the first pole piece layer.

5. A method as claimed in claim 4 further comprising the step of:

forming the third component with a front end which is recessed from the head surface.

6. A method as claimed in claim 2 further comprising the step of:

before forming the second component planarizing the write head assembly.

7. A method as claimed in claim 6 further comprising the step of:

before forming the first component planarizing the write head assembly.

8. A method as claimed in claim 6 further comprising the steps of:

forming the second component with a height into the head assembly which is greater than said zero throat height and which is located between the zero throat height and the insulation stack; and

forming a third component of the second pole piece which is stitched to the second component and which extends over the yoke and back gap regions and is magnetically connected to the back gap portion of the first pole piece layer.

9. A method as claimed in claim 8 wherein said ion milling also notches the pedestal with said track width.

10. A method as claimed in claim 9 further comprising the step of:

forming the third component with a front end which is recessed from the head surface.

11. A method as claimed in claim 10 further comprising the step of:

forming the second component as a flat layer on the pole tip, yoke and back gap portions and magnetically connected to the back gap portion of the first pole piece layer.

12. A method as claimed in claim 1 wherein the formation of the pole tip cap, the write gap layer and the first component comprises the steps of:

forming pole tip cap, write gap and first component layers on the pole tip, yoke and back gap portions; and

forming the second component with a zero throat height as well as said track width; and

when the second component is employed as said mask also ion milling the write gap layer and the pole tip cap with said track width and ion milling the pole tip cap, the write gap and the first component with said throat height.

13. A method as claimed in claim 12 further comprising the step of:

before forming the second component planarizing the write head assembly.

14. A method as claimed in claim 12 further comprising the steps of:

forming the second component with a height into the head assembly which is greater than said zero throat height and which is located between the zero throat height and the insulation stack; and

forming a third component of the second pole piece which is stitched to the second component and which extends over the yoke and back gap regions and is magnetically connected to the back gap portion of the first pole piece layer.

15. A method as claimed in claim 14 further comprising the step of:

before forming the second component planarizing the write head assembly.

16. A method as claimed in claim 12 wherein the throat height of the pole tip cap, the write gap layer and the first component is formed less than a height of the pole tip pedestal into the head.

17. A magnetic write head assembly which has a head surface and a track width at the head surface comprising:

a first pole piece layer of a first pole piece which has a pole tip portion, a back gap portion which is recessed from the head surface and a yoke portion which is located between the pole tip and back gap portions;

an insulation stack with at least one coil layer embedded therein on the yoke portion of the first pole piece layer;

a pedestal of the first pole piece on the pole tip portion of the first pole piece layer;

a write gap layer on the pedestal;

a first component of a second pole piece on the write gap layer with a width at the head surface which is greater than said track width and with a zero throat height (ZTH) that extends from the head surface into the head assembly where the first and second pole pieces first commence to separate after the head surface; and

a second component of the second pole piece on the first component which has said track width.

18. A magnetic write head assembly as claimed in claim 17 wherein the first component has a ZTH that is less a height of the pedestal into the head assembly.

19. A magnetic write head assembly as claimed in claim 18 wherein the pedestal is notched with said track width.

20. A magnetic write head assembly as claimed in claim 18 further comprising:

the second component having a height into the head assembly which is greater than said zero throat height and which is located between the zero throat height and the insulation stack; and

a third component of the second pole piece stitched to the second component and which extends over the yoke and back gap regions and is magnetically connected to the back gap portion of the first pole piece layer.

21. A magnetic write head assembly as claimed in claim 20 wherein the third component has a front end which is recessed from the head surface.

22. A magnetic write head assembly as claimed in claim 18 wherein the head assembly has a flat plane immediately below the second component.

23. A magnetic write head assembly as claimed in claim 22 further comprising:

the second component having a height into the head assembly which is greater than said zero throat height and which is located between the zero throat height and the insulation stack; and

a third component of the second pole piece stitched to the second component and which extends over the yoke and back gap regions and is magnetically connected to the back gap portion of the first pole piece layer.

24. A magnetic write head assembly as claimed in claim 23 wherein the pedestal is notched with said track width.

25. A magnetic write head assembly as claimed in claim 24 wherein the third component has a front end which is recessed from the head surface.

26. A magnetic write head assembly as claimed in claim 25 wherein the second component is a flat layer on the pole tip, yoke and back gap portions and is magnetically connected to the back gap portion of the first pole piece layer.

27. A magnetic write head assembly as claimed in claim 17 wherein the write gap layer and the first pole tip cap have said track width and the pole tip cap, the write gap and the first component have said zero throat height.

28. A magnetic write head assembly as claimed in claim 27 wherein the head assembly has a flat plane immediately below the second component.

29. A magnetic write head assembly as claimed in claim 27 further comprising:

the second component having a height into the head assembly which is greater than said zero throat height and which is located between the zero throat height and the insulation stack; and

a third component of the second pole piece stitched to the second component and which extends over the yoke and back gap regions and is magnetically connected to the back gap portion of the first pole piece layer.

30. A magnetic write head assembly as claimed in claim 29 wherein the head assembly has a flat plane immediately below the second component.

31. A magnetic write head assembly as claimed in claim 27 wherein the zero throat height of the pole tip cap, the write gap layer and the first component are less than a height of the pole tip pedestal into the head.

32. A magnetic head assembly, which has a head surface, comprising:

a read head and a write head;

the write head being located on the read head;

the read head including:

ferromagnetic first and second shield layers;

a read sensor located between the first and second shield layers;

the write head having a head surface and a track width at the head surface comprising:

a first pole piece layer of a first pole piece which has a pole tip portion, a back gap portion which is recessed from the head surface and a yoke portion which is located between the pole tip and back gap portions;

an insulation stack with at least one coil layer embedded therein on the yoke portion of the first pole piece layer;

a pedestal of the first pole piece on the pole tip portion of the first pole piece layer;

a write gap layer on the pedestal;

a first component of a second pole piece on the write gap layer with a width at the head surface which is greater than said track width and with a throat height that extends from the head surface into the head assembly where the first and second pole pieces first commence to separate after the head surface; and

a second component of the second pole piece on the first component which has said track width.

33. A magnetic head assembly as claimed in claim 32 wherein the head assembly has a flat plane immediately below the second component.

34. A magnetic disk drive comprising:

at least one magnetic head assembly;

the magnetic head assembly having a write head and a read head;

a read head and a write head;

the write head being located on the read head;

the read head including:

ferromagnetic first and second shield layers;

a read sensor located between the first and second shield layers;

the write head having a head surface and a track width at the head surface comprising:

a first pole piece layer of a first pole piece which has a pole tip portion, a back gap portion which is recessed from the head surface and a yoke portion which is located between the pole tip and back gap portions;

an insulation stack with at least one coil layer embedded therein on the yoke portion of the first pole piece layer;

a pedestal of the first pole piece on the pole tip portion of the first pole piece layer;

a write gap layer on the pedestal;

a first component of a second pole piece on the write gap layer with a width at the head surface which is greater than said track width and with a throat height that extends from the head surface into the head assembly where the first and second pole pieces first commence to separate after the head surface; and

a second component of the second pole piece on the first component which has said track width;

a housing;

a magnetic medium supported in the housing;

a support mounted in the housing for supporting the magnetic head assembly with said head surface facing the magnetic medium so that the magnetic head assembly is in a transducing relationship with the magnetic medium;

a motor for moving the magnetic medium; and

a processor connected to the magnetic head assembly and to the motor for exchanging signals with the magnetic head assembly and for controlling movement of the magnetic medium.